

REMARKS

Claims 5-9, 11-13, and 15-18, are all the claims pending in the application. Claims 1-4, 10, and 14, have been canceled without prejudice or disclaimer. Claims 5, 6, and 16 have been rewritten in independent form. And the subject matter of dependent claims 7-15 has been made to depend from each of claims 5, 6, and 16, by amending claims 7-9, as well as by the addition of new claims 17 and 18.

Because this amendment embodies the agreement with respect to the issues discussed at the interview of December 16, 2003, entry and consideration hereof are respectfully requested. Although no agreement was made with respect to claim 16, it includes a separator as do claims 5 and 6 and, therefore, should be subject to the same consideration.

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 1-16 under §103(a) as being unpatentable over Japanese Publication 11-315835 (hereinafter JP '835). Applicant respectfully traverses this rejection for the following reasons.

First, Applicant's arguments as presented July 2, 2003 are incorporated herein by reference.

Second, each one of claims 5, 6, and 16, independently sets forth a ball screw comprising: a screw shaft having a first helical ball rolling groove; a nut having a second helical ball rolling groove; a plurality of balls arranged in a helical raceway defined by the first and second helical ball rolling grooves, wherein at least one of the first and second helical ball rolling grooves has a surface with a surface roughness of 0.12 μm or less in average roughness (Ra) along a helical direction of the helical raceway; and a retainer rotatably supporting the balls.

Accordingly, the ball screw includes both a ball rolling groove of a specific surface roughness, and a retainer. This combination gives noise-reduction results that are unexpected in the art. For example, as set forth in the attached declaration of Mr. Toshiharu Kajita, and in the present specification—using a screw shaft and nut having a groove surface roughness (Ra, μm) of 0.19 and 0.18 as a standard—respectively, one of ordinary skill would expect a noise

reduction from use of a surface roughness of 0.12 μm to be -3.0 db, and a noise reduction from use of a separator to be -1.5 db for a total combined noise reduction of -4.5 db. However, unexpectedly, Mr. Kajita has discovered that when using the specified surface roughness together with a retainer, the noise reduction was in fact -8.0 db. See the specification at pages 7-12 and, in particular, Table 1, comparative samples 1-6, 1-5, 1-4, as well as sample 1-2.

In light of the above, one of ordinary skill in the art would not have found obvious Applicant's invention as set forth in claims 5, 6, and 16, or as set forth in dependent claims 7-9, 11-13, 15, 17, and 18. Accordingly, this rejection is believed to be in error and should be withdrawn.

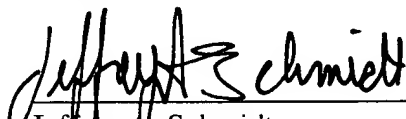
Conclusion

New dependent claims 17 and 18 have been added to further define the invention. These claims should be allowable at least by virtue of their dependency.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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